Towards an Ecosystemic Psychology of the Act. Reference, Validation, and Valence as Universal Intentional Functions

Ernesto Mascarell Perez
Independent Researcher
mascarell1960@hotmail.com

Abstract

The human behavioural sciences carry a hegemonic paradigm that amalgamates metaphysical objectivism, Popperian logicism, methodological individualism, and a reductionism that artificially decomposes reality. This article argues that such a paradigm has blocked the understanding of intentionality as a fundamental phenomenon of living systems. Against it, we propose an ecosystemic psychology of the act based on three universal intentional functions —reference, validation, and valence— that operate at all levels of complexity, from the cell to society. They are empirically grounded in affective neuroscience, ecological psychology, complex systems theory, enactivism, and Gestalt psychology. On this basis, we develop a research and teaching-learning methodology articulated in eight active questions. The proposal challenges hegemonic objectivism, individualism, and reductionism, and offers a framework for a radically situated, relational, and post-metaphysical science of behaviour. Against the objection of nihilism, we answer that the viability criterion of an act is not arbitrary: it is anchored in the satisfaction of universal and limited human needs, which operate at the personal, social, and natural levels, and provide an immanent normative basis without appealing to transcendentals.

Keywords: intentionality, intentional functions, valence, ecological psychology, complex systems, enactive methodology, human needs, critique of objectivism.

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1. Introduction: The Need for a Science without Metaphysics

The human behavioural sciences were born committed to a metaphysics that they rarely make explicit. From Platonism and modern rationalism they inherited an objectivism that postulates a reality independent of the observer and a truth

as correspondence (Popper, 1972). From logical positivism and critical rationalism they inherited a logicism that elevates formal logic to the sole tribunal of rationality (Popper, 1959). From liberal and Enlightenment philosophy they inherited a methodological individualism that takes the isolated subject as an irreducible atom, tearing it away from the social and ecological fabric. The joint operation of these three inheritances has produced a reductionism that fragments reality into watertight domains —neurobiology, psychology, sociology— and denies intentionality, affectivity, and normativity as real and irreducible properties of living systems.

This paradigm lacks empirical basis. There is not a single experiment that demonstrates the existence of a "third realm" of objective thoughts (Frege, 1918) nor of a truth as correspondence independent of the concrete coupling processes of an organism with its environment (Maturana & Varela, 1984; Varela, 1997). Scientific practices themselves, when studied in their historical and social context, show that logical and methodological rules are contingent products, not transcendental norms (Kuhn, 1962; Feyerabend, 1975; Latour & Woolgar, 1979). Individualism, for its part, contradicts the accumulated evidence on extended and socially distributed cognition (Hutchins, 1995; Clark & Chalmers, 1998; Tomasello, 2014).

Against this paradigm, we propose an ecosystemic psychology of the act, whose starting point is intentionality understood not as a property of individual consciousness, but as the oriented dynamics of any living system in its coupling with the environment. This article develops the three universal intentional functions that constitute the core of that framework —reference, validation, and valence— and deploys them in a research and teaching methodology.

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2. The Three Universal Intentional Functions

The idea of analysing intentionality through a triad of functions goes back to Franz Brentano (1874/2020), who distinguished representation, judgement, and love/hatred. However, his formulation was burdened by concientialism (denial of the unconscious), representational atomism, and methodological individualism. The three functions we propose retain the structural core of that triad, but have been reformulated in light of Gestalt psychology, the discovery of the unconscious, affective neurosciences, and the perspective of complex systems.

2.1. Reference

Reference is the function by which a system cuts out, distinguishes, or makes emerge a meaningful totality that becomes the *what* of its act. It implies a subjective pole (the system that refers) and an objective pole (the referred content), which co-emerge as a Gestalt, not as sensory atoms that are later associated.

Empirical evidence is robust. Gestalt psychology demonstrated that perception does not sum stimuli but immediately organises structured wholes (Köhler, 1929; Wertheimer, 1923). Gibson's ecological theory (1979) showed that organisms do not process abstract information but directly detect affordances —opportunities for action— in their niche. Predictive neuroscience has revealed that the brain is not a passive receiver but actively generates hypotheses that carve sensory input into relevant figures (Friston, 2010; Clark, 2016). At the cellular level, a membrane receptor already discriminates specific ligands, instituting reference without need of a nervous system (Koshland, 1981; Maturana & Varela, 1984). At the social level, a collective thematises a public problem (for example, climate emergency) by cutting it out from the background of the media agenda, in a process that no individual member controls (Luhmann, 1984; Latour, 2005).

Reference, therefore, does not require consciousness. Attention can operate implicitly, orienting the system towards certain contents without the subject having phenomenal experience of them (Bargh & Chartrand, 1999; Dehaene et al., 2006). Patients with unilateral neglect show how reference can selectively fail: they do not detect stimuli in the left hemifield, even though their elementary sensory processing is preserved (Driver & Vuilleumier, 2001).

2.2. Validation

Validation is the function by which the system sanctions the relevance or viability of the reference in its coupling with the environment. It is not a conscious propositional judgement, but an implicit, often unconscious, check that the distinction made works.

The predictive coding framework today offers the most complete model of this function. The brain continuously generates predictions about sensory input and compares those predictions with the actual signal. When the prediction error is minimised, the system implicitly validates its model; when the error persists, the model is destabilised and updated (Friston, 2010; Hohwy, 2013). This checking does not need to reach consciousness: it occurs massively at subpersonal hierarchical levels (Rao & Ballard, 1999; Clark, 2016). The feeling of evidence or certainty —what Brentano called *Evidenz*— is only the conscious correlate of a process that operates almost always below the threshold.

Validation also manifests in motor habits. When walking on uneven terrain, the body continuously adjusts the step without any deliberation; it is implicitly validating or rejecting support surfaces (Merleau-Ponty, 1945; Dreyfus, 2002). At the social level, collective systems validate or delegitimise discourses through mechanisms such as consensus, law, or informal sanction (Berger & Luckmann, 1966; Luhmann, 1984). Confirmation bias —the tendency to more easily validate what fits our prior beliefs— is a manifestation of how valence modulates validation, not an error of pure logic (Nickerson, 1998; Kahneman, 2011).

2.3. Valence

Valence is the function by which the system assigns an affective-motivational charge to the presented and validated totality —or even to a non-validated reference— and orients itself towards it by attraction or repulsion, with a gradable intensity. It is what moves the system to action, from a bacterium's approach to a nutrient to the most complex human emotion.

Affective neuroscience has identified brain systems dedicated to generating basic emotional states (seeking, fear, rage, care, panic, play), each of which instates a vector of attraction or rejection with a specific neurochemical and behavioural signature (Panksepp, 1998). Damasio (1994, 2010) showed that somatic markers —bodily signals of valence— are indispensable for decision-making, even in seemingly rational tasks. LeDoux (1996) described the fast and slow pathways of fear operating in parallel, evidencing that valence can be activated automatically and unconsciously. Motivation theory had already established, since Lewin (1935), that behaviour is organised by fields of forces with positive and negative valences.

Valence is not binary. It admits degrees, mixtures, and modulations. At the human level, it unfolds in qualitatively differentiated emotions (Russell, 2003; Barrett, 2017), but its functional core is continuous with bacterial chemotaxis (Macnab & Koshland, 1972; Koshland, 1981). Even complex phenomena such as empathy or aesthetic contemplation are, in our framework, elaborate modulations of the same basic valence function (de Waal, 2008; Vessel et al., 2012).

The three functions —reference, validation, and valence— do not operate sequentially, but as co-occurring aspects of a single intentional act. The Gestalt tradition obliges us to conceive them as an integrated totality, although their analytical distinction allows diagnosing specific failures in coupling: a system may not detect a signal (reference failure), detect it but discard it as noise (validation failure), or detect and validate it without being mobilised (valence failure).

3. Methodology: The Eight Active Questions

Consistent with the above foundations, our methodology does not seek universal laws or decontextualised statistical correlations, but the understanding and transformation of situated acts. An act can be a gesture, a decision, a symptom, a didactic interaction, or an institutional policy. The inquiry is structured in eight active questions, each of which unfolds in a set of verbs that concretise its operational dimension. The questions deploy the universal functions and anchor them in the concrete dimensions of the agent, execution, history, time, and place. In all of them, the three intentional functions are operating, although each question emphasises one of them.

Table 1. The eight active questions with their associated verbs and intentional functions

Question	Associated verbs	Dimension explored	Main function	Implicated functions
WHO?	To be, constitute, capacitate, temper, historise, belong, embody	The agent: physical, temperamental, biographical, competence, and bonding characteristics.	Reference	Validation, Valence
WHAT?	To present, distinguish, cut out, attend, name	The totality that emerges as figure for the system.	Reference	Validation, Valence
HOW?	To execute, embody, routinise, automate, improvise, solve,	The mode of execution: habits, body style, implicit knowledge, and	Reference	Validation, Valence

Question	Associated verbs	Dimension explored	Main function	Implicated functions
	rehearse, correct	problem-solving strategies.		
WHY? (purpose)	To tend, motivate, value, project, serve, protect, maintain	The systemic purpose: what the act maintains, protects, or pursues.	Valence	Reference, Validation
WHY? (cause)	To cause, determine, trigger, condition, record, repeat	The causal genealogy: history of couplings, proximal triggers, and remote causes.	Validation	Reference, Valence
HOW MUCH?	To charge, intensify, feel, matter, hurt, desire, fear	The intensity and sign of valence: force, affective weight, activation level.	Valence	Reference, Validation
WHEN?	To rhythm, sequence, synchronise, anticipate, precipitate, last, insist	Temporality: rhythms, phases, biographical and social cycles, opportune moment.	Validation	Reference, Valence
WHERE?	To situate, couple,	The ecology of the act: physical	Reference	Validation, Valence

Question	Associated verbs	Dimension explored	Main function	Implicated functions
	ecologise, nest, inhabit, arrange, limit	environment, social niche, available affordances.		

The methodology also yields a situated act didactics, with principles such as:

1. Start from the agent: attend to who learns, with what history, capacities, and style.
2. From content to act: design ecological practice situations, not transmit representations.
3. Make the implicit explicit: help become aware of habits, valences, and material conditions that sustain acts.
4. The body as axis: attend to posture, gesture, breathing, and proprioceptive sensations.
5. Deliberate practice with variation: repeat with adjustments until new coupling patterns are automated.
6. Holistic evaluation: assess the quality of the act in its context, not only the products.

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4. Discussion

4.1. Against Discontinuity between Species and Systems: Evidence from the Life Sciences

The metaphysics of human exceptionalism —the idea that there is an ontological leap between *Homo sapiens* and the rest of the living— has been refuted by multiple disciplines. Far from being a scientific hypothesis, it is a theological residue that the life sciences have been eroding from all flanks. We present here a synthesis of the main lines of evidence that converge on a vision of evolution as a fluid process, without absolute qualitative leaps, and therefore support our thesis that the universal intentional functions —reference, validation, and valence— operate continuously at all levels of agency.

Neurobiology of consciousness and animal cognition. Current evidence on phenomenal consciousness in non-human vertebrates (Griffin, 2001; Seth, 2021),

on symbolic communication in birds and mammals (Seyfarth, Cheney & Marler, 1980; Pepperberg, 1999), on tool making in corvids and primates (Hunt, 1996; Whiten et al., 1999), and on empathy and understanding of others' intentions in rodents, dogs, and primates (Bartal, Decety & Mason, 2011; Horowitz, 2011; de Waal, 2008; Call & Tomasello, 2008) demonstrates that the capacities usually attributed exclusively to humans are distributed across the animal kingdom. In particular, Jo Nagai's work (2022) on predictive processing and consciousness in animal models shows that the neural correlates of subjective experience are not exclusive to the human brain.

To this neurobiological evidence is added that from other disciplines. Palaeontology (Gould, 1977, 2002) shows that the fossil record does not draw a linear chain of progress towards the human being, but a bush of lineages where capacities such as consciousness stabilise tendencies already present in other taxa. Symbiogenesis (Margulis, 1967, 1998) and cellular evolutionary physiology (Arias, 2020) reveal that basic functions —discriminating, validating, orienting— already operated in prokaryotic ancestors and have homologues in unicellular eukaryotes, blurring the boundary between cellular and animal cognition. Molecular biology (Shapiro, 2011) documents that cells actively modify their genome in response to environmental signals, placing reference, validation, and valence at the molecular level of any cell. Finally, interspecific hybridisation and horizontal gene transfer (Boto, 2010, 2015; Martínez-Solano, 2015) demonstrate that species are not watertight compartments, but that the boundaries between them —including the human one— are porous and of degree, not of essence.

All these lines of research converge on the same message: there is no ontological abyss separating *Homo sapiens* from the rest of the living. The differences are real, but they are of degree, combinatorics, and complexity in the same universal intentional functions. Our proposal of reference, validation, and valence as functions that operate at all levels of agency —from the bacterium to society— is not a metaphorical speculation, but the most parsimonious conclusion in light of the scientific evidence accumulated by these disciplines.

4.2. The Normative Basis: Human Needs versus Desires

Here we must respond to the most serious objection that can be raised against us. If we have rejected truth as correspondence, logic as transcendental, and every metaphysical foundation, do we not necessarily fall into nihilism? If there is no external tribunal to distinguish right from wrong, is not every act equally valid? By what authority can we propose a methodology that aspires to "improve" acts?

The answer is clear and does not require appealing to any absolute: the viability criterion of a human act is the satisfaction of human needs. This idea, developed by Mascarell (2024), establishes a crucial distinction between needs and desires. Human needs are limited, universal, and operate at three interrelated levels: personal, social, and natural. Desires, on the other hand, are unlimited, culturally shaped, and can be functional or dysfunctional with respect to needs.

An act is more viable —more adequate, healthier, fairer— when it satisfies some human need without blocking the satisfaction of other needs in the system (personal, social, or ecological). We do not need a transcendent truth to affirm this; it is enough to observe the observable consequences of the act on the lives of people, communities, and ecosystems. Normativity does not descend from a logical heaven: it emerges from the dynamics of living systems that seek to maintain their organisation and thrive (Maturana & Varela, 1984; Varela, 1997), and in the human case, that thriving is defined by the satisfaction of a limited and universal set of needs.

This immanent —not metaphysical— normative basis is what allows us to affirm that our methodology is not arbitrary. The eight active questions are offered as a tool that can be evaluated by its capacity to help people and collectives understand and transform their acts in directions that better satisfy their needs, at the personal, social, and natural levels. The authority to propose it is not that of a logically demonstrated truth, but that of its verifiable usefulness for human life in its ecological and social context.

4.3. Against Reductionism: Levels of Agency and Functional Components

The hegemonic paradigm not only fragments knowledge into watertight disciplines; it also operates an ontological reductionism that confuses the true agents —living systems capable of autonomous operation— with the functional components that integrate them. An ecosystemic psychology of the act requires a rigorous clarification of this distinction, inspired by the framework of scale and dimensions of human development proposed by Mascarell (2024).

We propose to distinguish the following levels of agency —systems that, at their level of organisation, exercise the three intentional functions (reference, validation, valence) and maintain their identity through coupling with the environment— and that answer the question "who?" when we analyse an act:

- **Viruses:** Genomic evidence suggests that RNA viruses could represent replicative systems prior to the first cells (Forterre, 2006; Koonin, 2009; Villarreal, 2005). In that precellular world they already exercised primordial forms of reference, validation, and valence. Today, extracellular virions persist in the medium as inert particles and only fully deploy their intentional potential when coupling to a host cell. They are,

therefore, border systems that transit between the passive component and the functional agent.
- **Bacteria and archaea:** Unicellular agents that exercise reference (chemoreceptors), validation (metabolic coupling), and valence (chemotaxis).
- **Multicellular organisms (plants, animals, people):** Agents whose nervous system —when it exists— is a functional component subordinate to the organism as a whole, not an independent agent. A person is not a brain; it is a complete organism that couples to its physical and social niche.
- **Communities and ecosystems:** Collective agents with emergent properties —shared intentionality, norms, regulatory dynamics— that cannot be reduced to the sum of the individuals that compose them, but depend on them for their existence.

Each agent is characterised by possessing functional components —genes, organelles, neurons, brains, institutions— that are not autonomous agents in themselves. A gene does not have intentionality; it is the organism that exercises it through epigenetically regulated gene expression. An isolated brain does not perceive, validate, or assign valence; it is the embodied person that does so. An institution —a parliament, an educational system— is a functional component of the collective agent "political community", not a separate agent.

The relationship between these levels is not one of independence, but of nested interdependence. Every agent inhabits and is part of larger systems that in turn constitute it: the bacterium is part of an organism's microbiome; the person is part of a community and an ecosystem; the community is part of the biosphere. No level exists apart from the others. The emergent properties of each level are real and not deducible from the properties of the components, but neither do they float disconnected from them (Anderson, 1972; Deacon, 2012).

This multilevel ontology is the only one that allows a non-reductionist science. To explain is not to eliminate the higher level by reducing it to the lower; it is to show how the properties of one level emerge from the organisation of its components and its coupling with adjacent levels. The universal intentional functions operate at each level of agency, but with different material supports (chemoreceptors in the bacterium, embodied brain in the person, symbolic communication in the community) and with increasing degrees of complexity.

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5. Conclusion

We have presented an ecosystemic psychology of the act that challenges the objectivist, logicist, individualist, and reductionist paradigm, without thereby falling into nihilism. The definition of three universal intentional functions — reference, validation, and valence— solidly anchored in evidence from neurosciences, ecological psychology, and systems theory, allows analysing any human —and non-human— act as an oriented, affective, and situated coupling. We have established an ontology of levels of agency and functional components that allows precisely distinguishing the systems that exercise intentionality from the parts that compose them, and that recognises the nested interdependence of all levels of the living. The methodology of the eight active questions, with their associated verbs and headed by the fundamental question for the agent —who?— together with the situated act didactics derived from it, offer concrete tools to investigate and transform behaviour. The validity of this proposal does not rest on a metaphysics of truth nor on a transcendental logic, but on its capacity to contribute to the satisfaction of human needs in their personal, social, and natural dimensions. Intentionality, understood as the very logic of life, and human needs, understood as the immanent criterion of viability of our acts, are the two pillars on which a truly integrated science of behaviour at the service of life can be built.

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